

often impossible to guard. This has been especially emphasized this month, in which in practically every serious case reported, the actual damage was done by landslides, by the concentrated and torrential downrush of water from mountain slopes, or by the destructive action of small creeks suddenly converted into deep and violent streams.

Especially heavy damage was done to highways on the western slope of the Rockies. This section (and particularly that portion of it drained by the Uncompahgre River) experienced an unusual number of heavy rain-falls between July 25 and 29, resulting in numerous landslides, washouts, surface damage to land under cultivation, and, at the town of Ouray, Colo., a considerable destruction of tangible property. The greatest single instance of highway damage occurred to the Million Dollar Highway between Overton and Silverton Colo.

No adequate estimate of the losses is available, but it appears to have amounted to at least \$100,000.

Other more or less important instances of the destructive results of these floods are briefly noted below:

July 11, at El Paso, Tex.: Heavy damage to residential district by discharge from the slopes of Franklin Mountains.

July 14, in Pinoak Creek of Missouri, a tributary of the Meramec: Automobile overturned in sudden and violent overflow; 7 persons drowned.

July 15, near Tekamah, Nebr.: 5 bridges destroyed; railroad wreck due to washout; 1 death.

July 19, near Salida, Colo.: Automobile swept from highway by flood; 3 persons drowned.

July 19, near Stratton, Colo.: Railroad bridge damaged by high water in Sand Creek, resulting in train wreck; 1 sleeping car completely submerged; 9 deaths.

[All dates in July except as otherwise specified]

River and station	Flood stage	Above flood stages— dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
Tar:	<i>Feet</i>			<i>Feet</i>	
Tarboro, N. C. ....	18	18	18	18.0	18.
Greenville, N. C. ....	14	19	20	14.7	20.
Neuse:					
Neuse, N. C. ....	15	{ (1) 15	1	16.2	June 30.
			15	15.1	15.
Smithfield, N. C. ....	14	{ (1) 16	4	17.0	2, 3.
			17	14.4	16.
Santee:					
		{ (1) 13	5	13.9	June 29.
Rimini, S. C. ....	12		17	12.3	16.
		21	22	12.2	22.
		24	30	13.9	26, 27.
Ferguson, S. C. ....	12	{ (1) 26	6	13.2	2, 3.
			29	12.1	27, 28.
Jamestown, S. C. ....	12	5	13	13.1	8, 9.
EAST GULF DRAINAGE					
Etowah: Canton, Ga. ....	11	31	Aug. 1	15.8	31.
MISSISSIPPI DRAINAGE					
Scioto: Larue, Ohio. ....	11	28	28	11.2	28.
Wabash:					
Covington, Ind. ....	16	7	8	16.7	8.
Mount Carmel, Ill. ....	16	12	13	16.0	12, 13.
White, West Fork:					
Elliston, Ind. ....	19	{ 6	7	20.5	7.
		10	10	19.2	10.
Edwardsport, Ind. ....	15	5	13	17.3	8.
Mississippi:					
Angola, La. ....	45	(1)	3	52.4	June 8-13.
Baton Rouge, La. ....	35	(1)	4	43.5	June 10-13.
Donaldsonville, La. ....	28	(1)	3	34.0	June 10.
Reserve, La. ....	22	(1)	1	25.9	June 11.
New Orleans, La. ....	17	(1)	1	20.0	June 9.
Illinois:					
Peru, Ill. ....	14	2	15	15.3	9.
Havana, Ill. ....	14	2	25	17.3	17-19.
Beardstown, Ill. ....	14	(1)	30	19.6	18, 19.
Pearl, Ill. ....	12	10	27	16.2	19, 20.

<sup>1</sup> Continued from last month.

<sup>2</sup> Approximately.

River and station	Flood stage	Above flood stages— dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE—continued					
	<i>Feet</i>			<i>Feet</i>	
Missouri: Waverly, Mo.-----	23	8	8	23.0	8.
Smoky Hill:					
Mentor, Kans.-----	22	12	15	24.1	15.
Solomon, Kans.-----	24	12	13	24.7	12.
Solomon: Beloit, Kans.-----	18	27	27	18.9	27.
Grand:					
Chillicothe, Mo.-----	18	7	10	26.0	9.
Brunswick, Mo.-----	12	9	9	12.4	9.
Arkansas:					
Wichita, Kans.-----	9	14	16	9.8	15.
Yancopin, Ark.-----	29	(1)	1	44.8	May 28-30
Little Arkansas:					
Sedgwick, Kans.-----	18	11	16	23.6	11.
Hellers Grove, Kans.-----	12	12	13	13.9	12.
Neosho:					
Neosho Rapids, Kans.-----	22	13	16	25.1	14.
Le Roy, Kans.-----	24	16	18	24.7	17.
Iola, Kans.-----	15	18	18	15.9	18.
Oswego, Kans.-----	17	20	20	17.0	20.
Cottonwood:					
Elmdale, Kans.-----	32	11	12	36.3	11.
Emporia, Kans.-----	20	11	16	25.5	12.
Canadian: Logan, N. Mex.-----	4			10.6	10.
Atchafalaya:					
Simmesport, La.-----	41	(1)	2	46.4	June 12-16.
Melville, La.-----	37	(1)	5	42.2	June 9-16.
WEST GULF DRAINAGE					
Guadalupe: Victoria, Tex.-----	16	6	7	22.0	6.
PACIFIC DRAINAGE					
Colorado: Parker, Ariz.-----	7	(1)	(1)	11.9	June 2.

<sup>1</sup> Continued from last month.

<sup>2</sup> Continued at end of month.

55°.5' S: 633 (73)

#### EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, JULY, 1929

By J. B. KINCER

*General summary.*—During the first decade temperatures were rather moderate to high and growing crops made good advance generally, except in the dry Northwest, while soil moisture was sufficient from the Mississippi Valley eastward and showers were helpful in the Great Plains. The harvest of winter wheat had become general throughout the belt, but the weather was rather unfavorable for harvesting operations, with rainfall frequent and locally heavy through the central belt. Dry weather continued in the spring wheat section, except for locally beneficial showers, and rain was needed throughout the area. Moisture conditions were unfavorable west of the Rocky Mountains.

During the second decade the weather was mostly ideal for harvesting and haying in practically all parts of the country, and vegetation, on the whole, made satisfactory advance, except in the drier areas. Over the eastern half of the country rain was needed in many places, but there was no widespread, damaging drought, while in some eastern Cotton Belt sections showers were too frequent, but in many places moisture was needed, especially in the northern and more northwestern sections, as well as in most areas west of the Rocky Mountains.

During the last decade rain was needed quite generally over much of the country and especially in the Middle Atlantic States, while a general rain over the Corn Belt would have been helpful. The Northwest continued generally dry, but showers were beneficial in some central Rocky Mountain districts and the Southwest, where the range and water supply revived. Threshing and outdoor activities made excellent advance generally, except for some retardation by the extreme heat.

*Small grains.*—During the first decade there was some damage to winter wheat in parts of the Ohio Valley, but

cutting was general in western districts and threshing proceeded in the lower valley area. In the trans-Mississippi States cutting had begun north to central Iowa, but the excessive heat in the Great Plains, which preceded ripening, caused considerable deterioration. Harvest was nearly done in eastern Kansas and cutting was general in Nebraska, while harvesting and threshing made fair advance in Oklahoma and were about done in Texas; in the East gathering was in full swing north to Pennsylvania.

During the second decade winter wheat harvest was in progress to northern parts of the belt and well advanced generally. Excellent weather prevailed in the Ohio Valley and it was also mostly favorable in the western part of the belt, with threshing well along in central districts and largely completed in much of the Southwest. During the last decade harvest was nearly completed to the northern limits of the belt and threshing had begun to Minnesota and South Dakota; this work was about finished in southern parts and some local plowing was done.

During the first decade showers were more or less general over the spring wheat area, but more moisture was needed, especially for growth of late fields and filling of the early crop. Rains were mostly generous in central and western South Dakota, but were light in the heavy producing sections. During the second decade persistently hot, dry weather caused further deterioration, with too rapid ripening in North Dakota and many fields abandoned or cut for hay in Montana. Rains in South Dakota were helpful for the late crop, but some fields were too far advanced. During the last decade deterioration of late spring wheat continued in North Dakota and the crop was poor to only fair in Montana, with many fields reported a complete failure. Too rapid ripening occurred in Minnesota, where condition was mostly poor, but returns from early harvest in South Dakota were somewhat better than expected. Oats were heading to northern parts at the beginning of the month and at the close harvest was general to the northern border and threshing well along in central parts. Condition of flax was spotted, due to the drought; rye and barley harvests were well advanced at the close of the month.

*Corn.*—During the first decade moderate to high temperatures and fairly well-distributed showers made a rather good corn-growing period, with showers in the Northwest very helpful and sufficient soil moisture nearly everywhere east of the Rocky Mountains. The soil was too wet in parts of the Ohio Valley and the trans-Mississippi States, while growth was slow in the northern Plains. The crop in general was still late and uneven.

During the second decade temperatures were rather too low for best results in the eastern Corn Belt, but, on the whole, growth generally ranged from fair to excellent, although the crop was still irregular. In Missouri the dry, sunny weather was favorable and progress was excellent, with some fields in the roasting-ear stage. In Iowa growth was fair to good and much corn was in tassel and some shooting, but rain was needed in the northern and some central parts of the Great Plains. During the last decade rain was rather badly needed in most sections of the main Corn Belt, with the hot, dry weather in Iowa occurring at the critical pollination stage. Progress was mainly very good in the Ohio Valley, but there was some firing and deterioration due to dryness. Growth was re-

tarded in much of the southwestern belt due to the hot, dry weather, but in Nebraska advance was excellent, with much in tassel and some silking.

*Cotton.*—During the first decade the condition of cotton remained spotted in the Atlantic Coast States and weevil activity was unchecked, but progress was good to excellent. In the central belt growth was fair to good, but frequent rainfall favored weevil activity, with some shedding. In Arkansas and Louisiana excellent advance was made, with squares forming to northern Arkansas, but in Oklahoma the bulk of the crop was late and the weather favored weevil in central and eastern parts, although growth was good. In Texas showers improved conditions and plants were healthy and well rooted, but cloudy, showery weather favored weevil activity and fruiting was spotted; general condition was fairly good, but still late.

During the second decade showers were too frequent for cotton in some eastern parts of the belt, but otherwise progress was mostly fair to good, except that conditions favored weevil activity in many places. In central parts growth was fair to excellent, except for some shedding in the south and favorable weather for weevil activity in some districts. Conditions favored excellent progress in Arkansas, with squares, blooms, and bolls plentiful in central and southern portions, while in Oklahoma advance was mostly very good, with early plants fruiting nicely. In Texas scattered showers were favorable and good progress was made, except that rain was needed locally; plants were well rooted but small.

During the last decade progress varied from rather poor to excellent in the Atlantic States, although the crop was blooming freely to North Carolina and mature bolls were opening rapidly in Georgia, with picking becoming active in the south. In central sections progress of cotton was mostly good and condition fair to good, with the crop setting squares freely to Tennessee. Growth was excellent in Arkansas and condition very good, while in Louisiana advance was rather poor to fair, with some shedding. In Oklahoma progress was very good, although rain was beginning to be needed; the crop was mostly fruiting well, but condition was spotted. In Texas growth was largely good in the north but poor in the south where there was frequent rain, excessive cloudiness, and increased shedding; general condition of the crop was still fairly good.

*Miscellaneous crops.*—Haying was favored during most of the month, with no serious interruption to this work, and much hay was saved in good condition. Rain was needed for pastures, meadows, and ranges fairly generally throughout the country at the close of the month, with water holes low and ranges especially dry in the northern Great Plains and Rocky Mountains. Beneficial showers occurred in the Southwest. Livestock held up well.

Digging the early potato crop had begun north to the Dakotas at the close of the month, but the late crop needed rain rather generally. Moisture was rather badly needed for truck in the main producing sections of the Middle Atlantic States at the close of the month, and showers would have been of benefit generally. Tobacco was showing effects of the dry weather in Tennessee and Wisconsin, but elsewhere it did well. Sugar beets were largely satisfactory and sugar cane continued to make vigorous growth in Louisiana. Citrus continued in satisfactory condition throughout the month.